

ABSTRACT

The invention describes in detail the structure of a CMOS image sensor pixel that senses color of impinging light without having absorbing filters placed on its surface. The color sensing is accomplished by having a vertical stack of three-charge detection nodes placed in the silicon bulk, which collect electrons depending on the depth of their generation. The small charge detection node capacitance and thus high sensitivity with low noise is achieved by using fully depleted, potential well forming, buried layers instead of undepleted junction electrodes. Two embodiments of contacting the buried layers without substantially increasing the node capacitances are presented.